NOXIOUS AND INVASIVE WEEDS TECHNICAL MEMORANDUM

DATE: September 1, 2020

TO: Scott Prior (SE Group)

FROM: Rea Orthner

RE: Keystone Resort – Bergman Bowl Project

Scott,

The purpose of this memo is to provide a summary of noxious and other invasive weeds present within and adjacent to Keystone Resort's (Keystone) Bergman Bowl Project, which is currently being analyzed as an Environmental Assessment by the White River National Forest (WRNF). Briefly, this project includes the construction of one new chairlift, grading and tree removal for new ski trails and glades, installation of underground snowmaking lines, and the expansion of the existing Outpost Restaurant. All the proposed projects are within Keystone's existing Special Use Permit (SUP) area.

Methods

A site-specific field reconnaissance for noxious and other invasive weeds was conducted in August of 2019 and 2020. All proposed ground-disturbing activities were walked, and the locations of noxious weeds were mapped with a Garmin GPSMap60csx GPS unit and the information was digitized into Geographic Information System (GIS). The noxious and invasive plant inventory was conducted by Rea Orthner, a WRNF approved botanical contractor, and several associates. In addition, the existing noxious weed contractor for Keystone Resort was contacted. This contractor, Ms. Lisa Taylor, provided additional information on noxious and invasive weeds currently being treated at the resort[i].

Existing Conditions

The Bergman Bowl project area is relatively pristine and noxious and invasive weeds are uncommon. In fact, only one noxious weed species was observed during field reconnaissance. This species, Canada thistle (*Cirsium arvense*), was identified in a small patch adjacent to Foxtrot Road in the southern portion of the project area.

However, within the larger Keystone Resort there are numerous species of weeds present (see Table 1). These species include several List B noxious weeds: scentless chamomile (*Tripleurospermum inodorum*), oxeye daisy (*Leucanthemum vulgare*), yellow toadflax (*Linaria vulgaris*), musk thistle (*Carduus nutans* subsp. *macrolepis*), and leafy spurge (*Euphorbia esula*). In addition, orange hawkweed (*Hieracium aurantiacum*), a List A species, was recently discovered adjacent to a base area parking lot. Finally, two invasive species that are not on the noxious weed list appear to becoming increasingly problematic at Keystone, include curly dock (*Rumex crispus*) and kochia (*Bassia scoparia*). All of these weeds are currently being controlled.

Invasive species have been identified by the Chief of the Forest Service as one of the four significant threats to NFS lands. The Forest Service National Strategy is based on four components: 1) prevention, 2) early detection and rapid response, 3) control and management, and 4) rehabilitation and restoration. On February 3, 1999, Executive Order 13751 *Safeguarding the National Forest from the Impacts of Invasive Species* was signed. The Order requires agencies to utilize programs and

authorities to take steps to prevent the introduction and spread of invasive species, and to support efforts to eradicate and control invasive species that are established. Other authorities related to noxious weed management include the Federal Noxious Weeds Act (7 USC 2801), Forest Service Manual section 2080, Forest Service Handbook 2209.23, Section 330, the 2002 WRNF Land and Resource Management Plan as amended, and the Colorado Noxious Weed Act (8 CCR 1206-2). The Colorado Noxious Weed Act directs the Department of Agriculture to develop and implement management plans for all List A and List B noxious weed species. There are no List A Noxious Weeds within the Keystone Bergman Bowl project area, however one List A species (orange hawkweed) was recently discovered at a base area parking lot. In addition, there are six List B species known from Keystone and two additional species considered to be invasive. Only one of these species, (*Canada thistle*), actually occurs within the Bergman project area.

TABLE 1. NOXIOUS AND INVASIVE WEEDS – KEYSTONE SKI RESORT

Scientific Name	Common Name	Noxious Weed Class	Management Status
Perennial Forbs			
Cirsium arvense	Canada thistle	List B	Suppression
*Euphorbia esula**	Leafy spurge	List B	Elimination
*Hieracium aurantiacum**[+]	Orange hawkweed	List A	Elimination
*Linaria vulgaris**	Yellow toadflax	List B	Suppression
Leucanthemum vulgare*	*Oxeye daisy*	List B	Suppression
Rumex crispus*	*Curly dock*	n/a	n/a
Annual/Biennial Forbs			
*Bassia scoparia**	Kochia	n/a	n/a
*Carduus nutans subsp. macrolepis**	Musk thistle	List B	Elimination by 2020
*Tripleurospermum inodorum**	Scentless chamomile	List B	Elimination by 2022

*Not observed within the Bergman Bowl project area, but recorded for Keystone Ski Resort

[+]Orange hawkweed was identified adjacent to a base area parking lot and was treated in 2020.

Management Status Souce: https://www.colorado.gov/pacific/agconservation/county-weed-programs; and List B Management Plan Web Database for Summit County (updated Apr-01-2017).

Elimination: means the removal or destruction of all emerged, growing plants of a population of List A or List B species designated for eradication by the Commissioner.

Suppression: means reducing the vigor of noxious weed populations within an infested region, decreasing the propensity of noxious weed species to spread to surrounding lands, and mitigating the negative effects of noxious weed populations on infested lands.

ENVIRONMENTAL CONSEQUENCES

Alternative 1 - No Action

Under the No Action Alternative, there would be a continuation of existing management practices. There would be no new recreational facilities and no additional snowmaking coverage. Noxious weeds would continue to be managed under the existing Forest Service and Keystone agreements.

Alternatives 2 and 3 – Proposed Action & Action Alternative

Under Alternatives 2 and 3, the existing populations of noxious and invasive weeds could potentially

spread into the relatively uninfested areas of Keystone as well as increase in abundance and density in their current locations. The greatest risk of noxious weed dispersal occurs when ground disturbing activities take place in mid- to late summer when the majority of weed species are producing seeds. If construction equipment travels through or works weed infested areas when weeds are actively producing seed, the seeds could potentially become transferred to other sites via soil or plant parts embedded on construction equipment or construction personnel.

A series of design criteria and best management practices have been identified and would be employed for the approved projects. With implementation of these criteria, the threat of increased weed spread would be lessened. The main element would be the development of a Noxious Weed Risk Assessment and Treatment Plan (see GDC No. N1[ii]) which will identify weed control methodologies including equipment cleaning, pretreatment, and post-construction monitoring and treatment. We strongly encourage that post-construction noxious weed treatment and monitoring be conducted for at least three consecutive years in the Bergman project area, or until a satisfactory condition is present, after completion of any construction activities within the project area.

[i] Taylor, Lisa. Personal communication with Rea Orthner on September 1, 2020. www.weedypies.com
[ii] White River National Forest. Mountain Sports Program. Project Planning. Ski Area General Design Criteria. Update: November 2018.